



Training the Future Force Soldier

USAAC Accessions Research Consortium

27 Jan 2004

**Scott E. Graham, Ph.D.
ARI Infantry Forces Research Unit
Fort Benning, GA**



(706) 545-2362

scott.graham@benning.army.mil

Land Warrior V1.0



Head Assembly

- Color Display
- Night Capability (I2 and Thermal)
- Audio System



Weapon Assembly

- M4 Modular Weapon System
- Multifunction Laser
- Day Light Video Sight



Body Assembly

- Computer
- GPS
- Soldier Control Unit
- Handheld Display

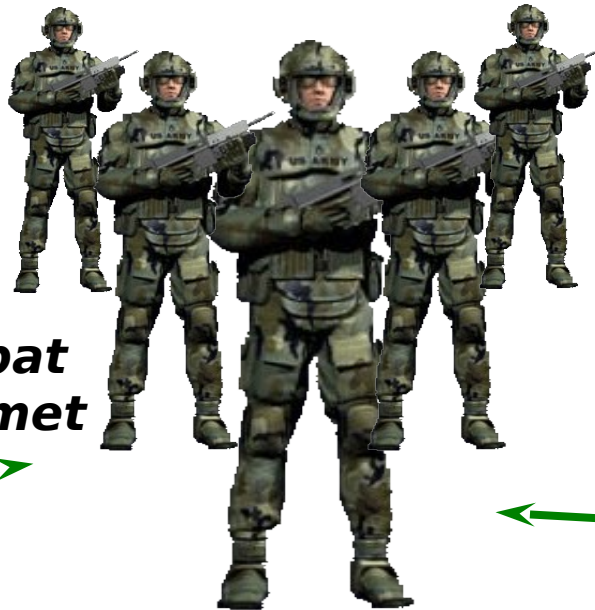




Objective Force Warrior (OFW) (S&T to support LW Block III)



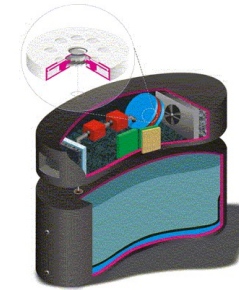
Netted



**Interface with
Robotic Mule,
UAV, Soldier
UGVs**

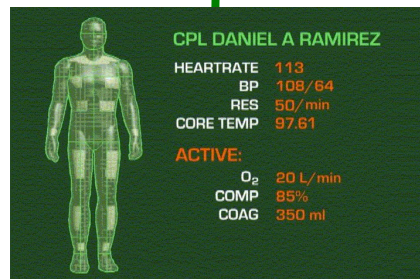
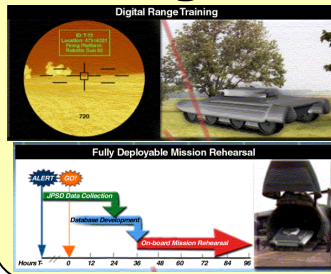


**Integrated Combat
Ensemble & Helmet**

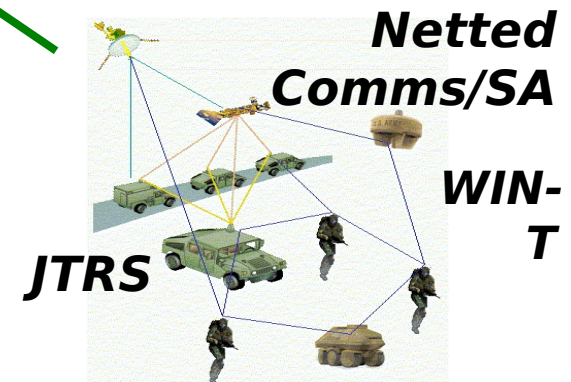


**Lightweight
Hybrid Power
System**

Embedded Training



**Physiological Status
Monitor**





OFW Training Issues

Challenges

- OFW Goal - 10-20 fold increase in combat effectiveness
- How to take advantage of emerging OFW capabilities, operational concepts, and TTPs
- What to train - How to train -
How to measure if successful

Requirement: State-of-the-art training methods that allow small unit leaders and teams to take full advantage of new OFW capabilities, operational concepts and TTPs



Presentation Outline

- SOF training lessons
- Land Warrior training lessons learned
- Embedded training issues and concerns



SOF Training Lessons

- **Future Force/CSA vision requires a culture change**
 - **Synthesis of the best from the conventional and SOF**
 - **Major challenge: How to raise the level of close combat fighting skills in Future Force small units to those of SOF**
 - **Not only combat arms, but CS and CSS**
- **Research identified successful SOF training technologies and techniques for training close combat skills**
- **SME panel: Majority had extensive special mission unit experience and rank of sergeant major**
- **Some solutions are expensive - ultimately tradeoffs between material, training, doctrine, organization**



Training Time

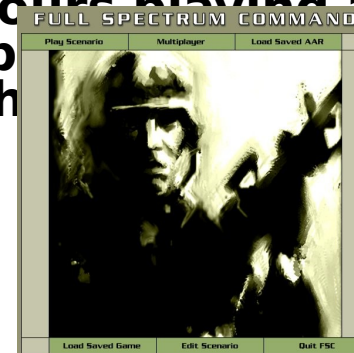
- **Training more, and more complex, tasks to lower echelons (i.e., SOF-like) will require more training time**
- **Introduction of new equipment greatly impacts training time**
- **Training distracters hurt**
 - **“Violation of white space” & post support**
- **Need for more efficient (multi-)echelon training**
- **Greater emphasis on “training management”**
 - **“Hip pocket” training, Elimination of soldiers manual of common tasks & job books**
- **Mandatory training needs to be examined**
- **Desert Storm success - a month of decentralized**



Computer Games to Train Command and Control Skills



- Partnered with Institute for Creative Technologies and RDECOM to assess effectiveness of ICT Games Project
- “Full Spectrum Command” designed to train adaptive C2 skills for Infantry Captains Career Course
- Assessed adaptive decision making with level Janus scenarios
- Game well received
- Two hours playing and three hours of debriefing was insufficient time to harness the full potential of the game





Crawl - Walk - Run

- **Establish basic proficiency before adding technological tools or shortcuts**
 - **Technology aids may enhance soldier's performance of task, but reduce need to understand basics**
- **What are the OFW fundamental skill requirements?**
- **Skill mastery - standards should be met then exceeded**
- **Increase pace or difficulty of conditions to get optimum proficiency, e.g., night, weather, soldier load, ammo levels**
- **For greatest proficiency, train on the hardest collective tasks with greatest number of critical individual tasks**



Combat-Focused Training

- **Training must routinely push soldiers and immerse them in realistic, challenging tactical environments**
- **Routinely include “worse case scenarios” and “surprises.”**
 - **Link between surprises, contingency planning, SA projection**
- **Simulations may be best for “walk” training phase.**
 - **May inaccurately represent some real world conditions**
- **Believed linked to soldier retention**



Visualization and Repetition

- **Two aspects of visualization important for skill mastery**
 - **Clearly know what correct (or expert) performance looks like**
 - **Cultivate image of what was going to happen**
- **Repetition of (subtask) procedures is critical**
- **Use of video and video cameras as a means to both demonstrate correct performance and to provide feedback.**
- **Thoughtful reflection must accompany and precede any repetitive drill session. Also, must consider “what ifs?”**



High Quality Trainers

- **System must produce motivated, well-trained instructors**
- **Hired professional instructors, many who were former unit members - “Brought an élan to SOF units”**
 - **Army should consider professional instructor corps**
- **Most important factor for successful trainers is to have and understand underlying knowledge and skills**
- **Training technologies must not allow instructors to blindly do their job**
 - **Need for train-the-trainer tools**



Train-the-Trainer Tools

- Ensuring trainers can take full advantage of training technology
- Developing general guidelines and prototype train-the-trainer tools

Engagement Skills Trainer 2000

- Multi-lane individual and collective marksmanship trainer
- Initial entry training application



Full Spectrum Warrior

- Institute for Creative Technology Xbox game
- Light infantry squad leader trainer

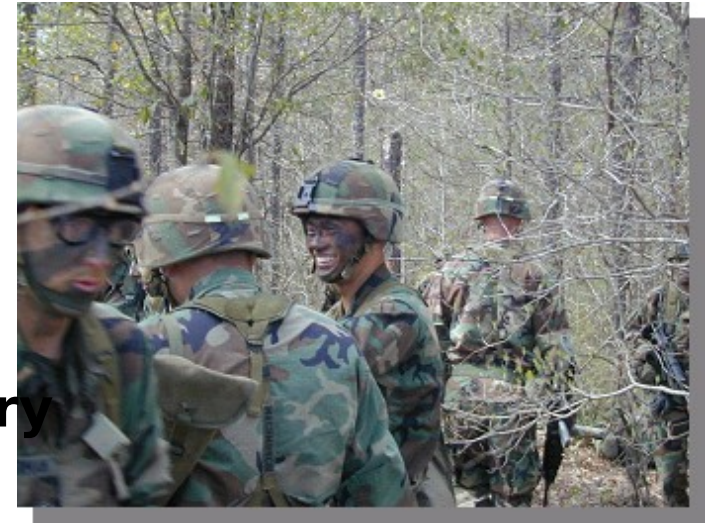




Transforming Officer Initial Entry Training

Basic Officer Leader Course (BOLC)

- Six weeks common leadership training
 - Not Branch Specific, e.g., Infantry
- Four pilots conducted at Fort Benning

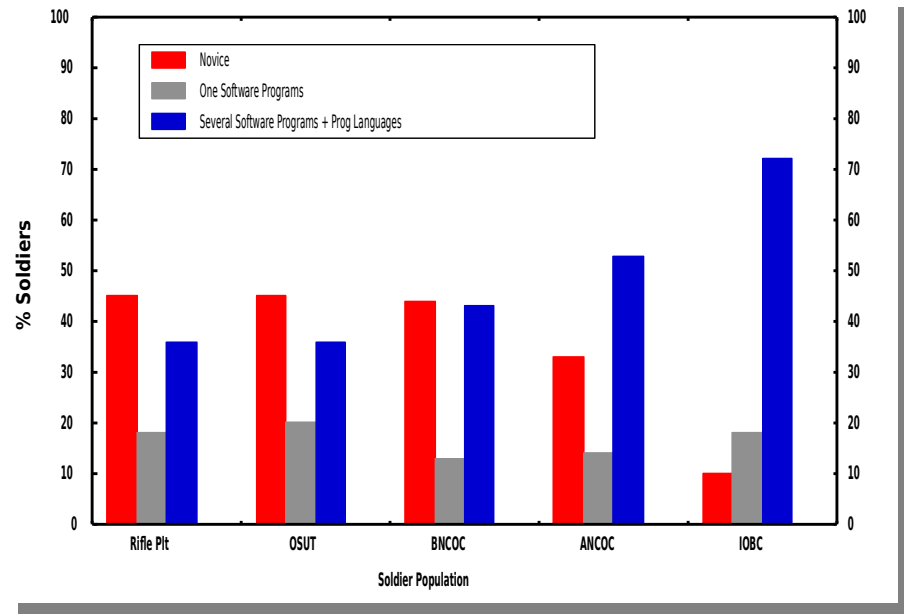
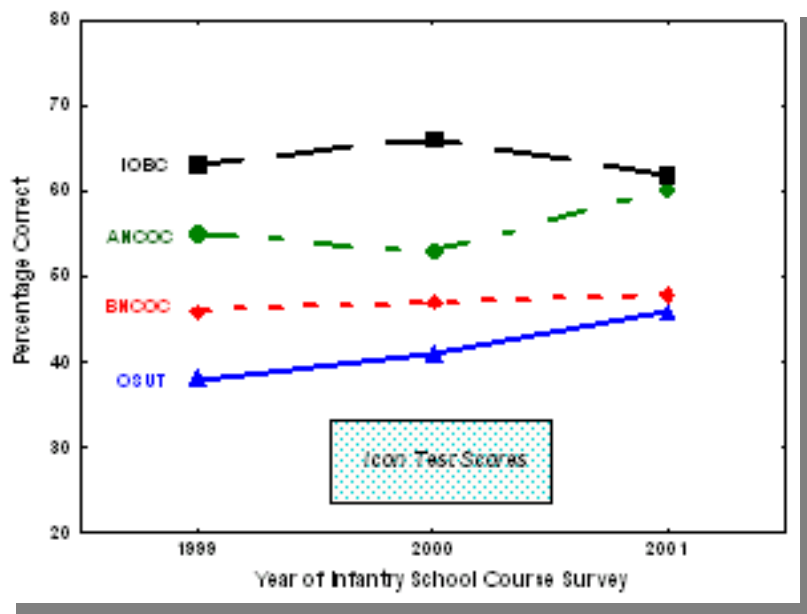


- Leader development is a complex interaction of various factors
- Need to select and prepare motivated instructors
- Improve counseling training
- Set and enforce standards



LW Training Lessons Learned

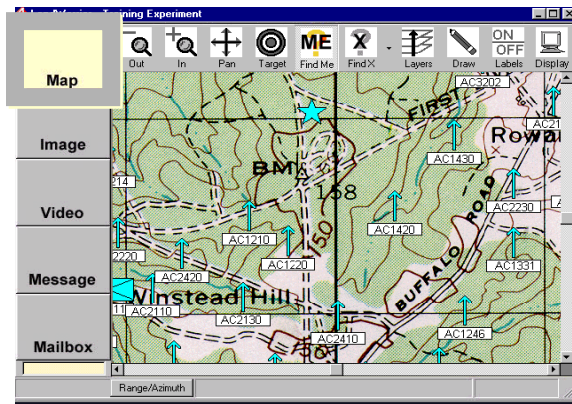
- Training audience is diverse
 - Large differences in how fast soldiers become proficient
 - Must be able to tailor instruction





LW Training Lessons Learned

- Ensure pre-requisite knowledge and skills before new training



- Train tasks within the context they will be executed - must know not only how, but when, and why
- Computer-based training - Challenge to overcome limitations in authoring tools, measurement of cognitive processes, and flexible system operational procedures



LW Training Lessons Learned

- **More challenges for lead as trainers**
- **Trainer must be able to see trainees actions**
- **“Walk and chew gum at the same time” issues.**
 - **Helmet mounted displays: more or less SA**
 - **Wrist-mounted displays limit functionality**



Here Comes The Holodeck: Virtual Reality + Artificial Intelligence = New

The use of virtual reality or arcade games to practice hand-eye coordination or quick reaction, or even to teach factual information is easy to understand and well accepted. But can such techniques also teach sound judgment and clear thinking in an emergency?

A "Mission Rehearsal Exercise" developed for the U.S. Army by ISI, the USC Institute for Creative Technology (ICT).....





OFW Embedded Training Issues

- **Advantages (and limitations) of embedded training have been identified for thirty plus years**
- **Call for increased use of embedded and virtual trainers for soldier, leader, and crew gated training tasks, prior to live training**
- **OFW Training Team determining which tasks can appropriately be trained with ET**
- **Few successful examples of ET in Army systems**
- **ET is more than merely practicing with the prime system**



OFW ET Sample Concepts

- **Reach back to Reimer Digital Library ~ Embedded “reading”**
- **FMs and TMs loaded on system ~ Embedded “references”**
- **Multi-media instruction loaded on system or accessed via network, e.g., from mule**
- **OFW system controls to execute procedures/tasks in a training mode with stand-alone performance feedback.**
- **Virtual reality - use OFW system in virtual environment, e.g., Soldier-CATT, SVS**
- **Augmented reality - Integration of live and virtual images**
- **Dual use training and mission planning/rehearsal**



More ET Issues

- **Accelerating the development of cognitive, decision-making, and leader skills is difficult with or without ET**
- **Computer-based training (CBT) can be very good**
 - **Developing higher level cognitive skills requires money and R&D**
 - **Effects of helmet-mounted and/or wrist displays for CBT is unknown**
- **Full-task embedded trainer would be very difficult/expensive**
- **System access may be a problem**



Conclusions

- **Future Force soldiers and small units must be trained to take full advantage of new system capabilities, operational concepts, and TTPs**
- **Enhanced capabilities and greater responsibility at lower levels will undoubtedly require more training, not less**
- **Key Components**
 - **Understanding basics**
 - **Practicing to mastery levels**
 - **Quality, motivated trainers with good tools**
 - **Performance measurement and feedback**
- **There is no silver bullet**

